

What is claimed is:

1. An artificial turf system which includes a support layer, a base layer, and an outer layer, comprising:

an area of selected size and composition comprising said support layer;

at least one grid consisting of a plurality of interconnected cells arranged over said support layer comprising said base layer;

each cell of said cells comprises an upstanding tubular member having an upper portion and a lower portion;

said upper portion having a first diameter and is adapted to support said outer layer, said lower portion having a second and larger diameter and is adapted to engage with said support layer;

said lower portion providing each said cell with vertical flexibility; whereby,

said at least one grid is capable of selected vertical movement due to impact providing said artificial turf system with improved softness and shock absorption.

2. The artificial turf system of claim 1 wherein said support layer is substantially planar and comprises at least one of compacted sand, dirt, concrete, gravel and asphalt.

3. The artificial turf system of claim 1 wherein said support layer comprises an upper which includes a stabilizer sheet and a lower layer which

includes soil, concrete, gravel and asphalt, said upper layer being positioned over said lower layer.

4. The artificial turf system of claim 1 wherein each said cell is formed of semi-rigid plastic.

5. The artificial turf system of claim 1 wherein said grid is shaped to be preferably one of square and rectangular.

6. The artificial turf system of claim 1 including resilient securing members interconnecting adjacent of said cells of said grid, said securing members allowing relative movement between said cells.

7. The artificial turf system of claim 6 wherein said securing members are integral with said lower portion of adjacent of said cells.

8. The artificial turf system of claim 1 wherein said upper portion is of uniform diameter and includes vent holes.

9. The artificial turf system of claim 1 wherein said lower portion is cone shaped and extends downwardly and outwardly from said upper portion.

10. The artificial turf system of claim 6 wherein each said securing member is polygonal shaped.

11. The artificial turf system of claim 6 wherein each said securing member is diamond shaped.

12. The artificial turf system of claim 1 wherein said grid is integrally formed.

13. The artificial turf system of claim 6 wherein said securing members comprise shaped synthetic filaments.

14. The artificial turf system of claim 1 wherein said base includes a transition layer arranged over said grid.

15. The artificial turf system of claim 14 wherein said transition layer comprises a grate formed of at least two arrays of substantially diagonally arranged synthetic filaments.

16. The artificial turf system of claim 15 wherein said filaments are integral.

17. The artificial turf system of claim 15 wherein said filaments are circular and of different sizes.

18. The artificial turf system of claim 15 wherein said transition layer includes at least one layer of porous felt secured over at least one surface.

19. The artificial turf system of claim 15 wherein said felt is between 4 oz. and 10 oz. per square yard.

20. The artificial turf system of claim 15 wherein each array of said filaments is disposed along a single plane.

21. The artificial turf system of claim 15 wherein said filaments forming different of said arrays are of different sizes.

22. The artificial turf system of claim 14 wherein said outer layer includes pile tufts secured with a backing fabric, said backing fabric resting on said transition layer.

23. The artificial turf system of claim 1 wherein said outer layer includes pile tufts secured with a foam backing, said foam backing resting on said cells.

24. The artificial turf system of claim 1 wherein said upper layer comprises a pile fabric with filler surrounding said pile.

25. The artificial turf system of claim 24 wherein said filler is STF.

26. A base layer for use with an artificial turf system which further includes a support layer, and an outer layer, said base layer including:

a flexible mat, said mat comprising a plurality of inter-connected grids, each said grid comprising a plurality of inter-connected vertically disposed multi-diameter cells arranged in a polygonal configuration;

each said cell being formed of a semi-flexible plastic and includes an upper portion with an upper edge for supporting said outer layer and a lower portion with a lower edge for engaging with said support layer, each said cell being constructed to provide relative flexibility between said upper and lower portions; whereby

said base layer provides said turf system with support and vertical resilience against impact.

27. The base layer of claim 26 wherein each said cell is about 1" in length.

28. The base layer of claim 26 wherein said upper portion has a constant diameter of about 2.5" and said lower portion extends downwardly and outwardly from said upper portion to a maximum diameter of about 3.5".

29. The base layer of claim 28 wherein said lower portion extends from said upper portion at an angle of about 75° of vertical.

30. The base layer of claim 28 wherein said lower portion includes a plurality of radially extending members.

31. The base layer of claim 26 wherein said upper portion includes a plurality of vents.

32. The base layer of claim 26 wherein said upper edge includes a plurality of inwardly directed flexible extensions.

33. The base layer of claim 26 including resilient securing members engaging outer edges of said cells.

34. The artificial turf system of claim 33 wherein selected outer ones of said securing members include outwardly directed fingers.

35. The artificial turf system of claim 34 wherein said outwardly directed fingers are adapted to interconnect with a connector formed on selected outer cells of an adjacent grid, whereby a plurality of said grids may be interconnected forming a mat.

36. The base layer of claim 33 wherein each of said securing members is capable of elongating, compressing and flexing.

37. The base layer of claim 33 wherein said securing members comprise shaped synthetic filaments.

38. The base layer of claim 33 wherein said securing members are polygonal shaped.

39. The base layer of claim 26 wherein adjacent vertical axes adjacent of said grid forming cells are spaced by about 4".

40. The base layer of claim 39 including a semi-flexible transition layer, said transition layer being arranged on upper edges of said grid forming cells.

41. The base layer of claim 40 wherein said transition layer includes a semi-flexible plastic grate

42. The base layer of claim 40 wherein said transition layer includes a porous felt layer.

43. The base layer of claim 42 wherein said felt layer is secured with a semi-flexible plastic grate.

44. The base layer of claim 43 wherein said felt layer comprises a felt on upper and lower sides of said grate.

45. An outer layer for use with an artificial turf system which further includes a base layer and a support layer, said outer lay comprising:

a backing fabric supporting pile tufts of between ¼" to 4" in length, said tufts being formed of synthetic ribbons with a width of between 1/32" to 3/8";

a porous synthetic backing for securing said pile tufts with said backing fabric;

a filler, comprising polished silicon dioxide particles of substantially equal size interspersed over said backing fabric and about said tufts up to at least half said tuft length; whereby,

said outer layer retains resiliency, porosity and substantial equal density.

46. The outer layer of claim 45 wherein said silicon dioxide particles are colored one of brown, green, red, and black.

47. The outer layer of claim 45 wherein said silicon dioxide particles are between 8 and 60 mesh.

48. The outer layer of claim 45 wherein said backing one of latex, polyurethane, polyethylene and is up to 1cm thick.

49. The outer layer of claim 45 wherein said silicon dioxide particles are substantially round and present no sharp edges.

50. The outer layer of claim 45 wherein said silicon dioxide particles are spread over said backing fabric evenly to a depth of between .25 to 2.00 inches.

51. The outer layer of claim 45 wherein said silicon dioxide particles are sized within about five mesh sizes.

52. An artificial turf system including a support layer, a base layer and an upper layer wherein;

a stabilizer sheet is disposed over the entire area comprising said support layer;

said upper layer includes a backing fabric carrying ¼" to 4" pile tufts, said pile tufts being formed of synthetic ribbons;

silicone dioxide particles spread evenly over said backing fabric and about said pile tufts;

said silicone dioxide particles being within eight mesh sizes;
said base layer comprising a mat formed of interconnected cells,
said mat being disposed between said support layer and said outer layer; wherein
said support layer, said base layer and said outer layer form said
artificial turf system with a permanent G-max within about 20% of a G-max of 100.

53. The artificial turf system of claim 52 wherein said silicone dioxide
particles are within five mesh sizes.